

# Risk of acute kidney injury after exposure to gadolinium-based contrast in patients with renal impairment

Shih-Bin Su, *Chi-Mei Medical Center, Taiwan*

Chih-Chiang Chien, *Chi-Mei Medical Center, Taiwan*

Ching-Yih Lin, *Chi-Mei Medical Center, Taiwan*

**Background and Aims:** Gadolinium-based contrast media (Gd-CM) are reported to induce acute kidney injury (AKI) in a high-risk population group at the usual dose for magnetic resonance imaging (MRI) and magnetic resonance angiography (MRA) examinations. We assessed gadolinium-induced nephropathy in patients with renal impairment who underwent MRI or MRA examinations, and evaluate the risk factors.

**Methods:** In this retrospective study, 238 patients with baseline renal impairment, who received MRI or MRA examinations with Gd-CM, were recruited.

**Results:** After all other AKI causes—liver decompensation, severe heart failure, all kinds of shock, and severe sepsis—and patients on dialysis were excluded, 158 patients were enrolled. AKI was defined as a decrease in GFR > 10% of baseline data within 3 days after Gd-CM administration. Regression analysis was used to find independent risk factors for gadolinium-induced ARF (Gd-AKI). Twenty-six of the 158 patients (16.5%) developed Gd-ARF. There were no significant differences in gender, age, or baseline eGFR between those who did and who did not develop AKI. Co-morbid coronary artery disease, liver cirrhosis, diabetic mellitus, and hypertension were not significantly associated with the development of Gd-ARF. However, sepsis was an independent risk factor for Gd-AKI after multivariate regression analysis (adjusted odds ratio: 4.417; 95% confidence interval: 1.671, 11.676,  $P = .03$ ).

**Conclusions:** Sepsis was an independent risk factor for Gd-CM nephropathy at the usual dose for MRI and MRA examinations. It is important to identify high-risk patients and closely monitor renal function after Gd-CM administration.

## References:

1. Barrett, BJ, Parfrey, PS. Clinical practice. Preventing nephropathy induced by contrast medium. *N Engl J Med.* 2006;354:379-386.
2. Nash, K, Hafeez, A, Hou, S. Hospital-acquired renal insufficiency. *Am J Kidney Dis.* 2002;39:930-936.
3. Kaufman, JA, Geller, SC, Waltman, AC. Renal insufficiency: gadopentetate dimeglumine as a radiographic contrast agent during peripheral vascular interventional procedures. *Radiology.* 1996;198:579-581.
4. Boyden, TF, Gurm, HS. Does gadolinium-based angiography protect against contrast-induced nephropathy?: A systematic review of the literature. *Catheter Cardiovasc Interv.* 2008;71: 687-693.
5. Robert, A, Bonneville, F, Miralbes, S, et al. Gadolinium in arteriography and interventional radiology: 39 patients. *J Radiol.* 2002;83:1759-1763.